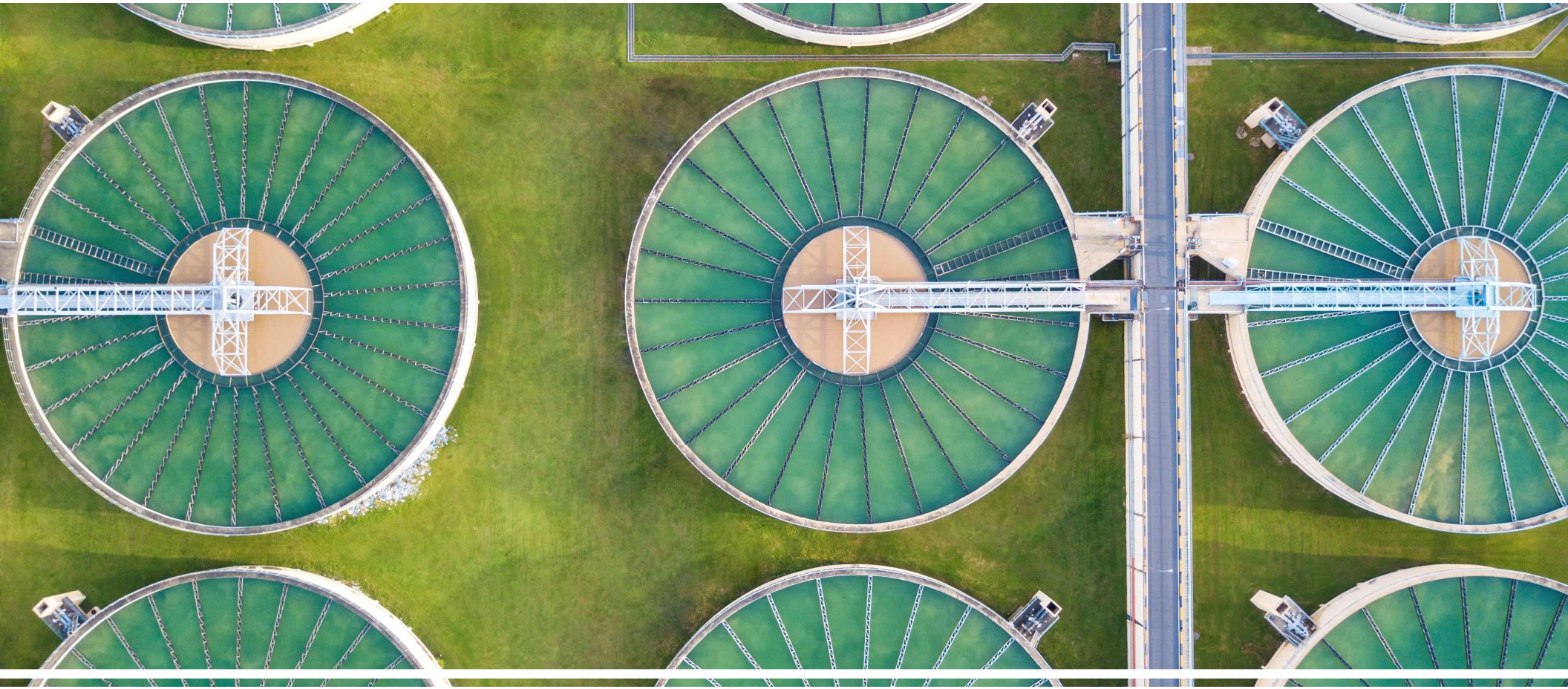
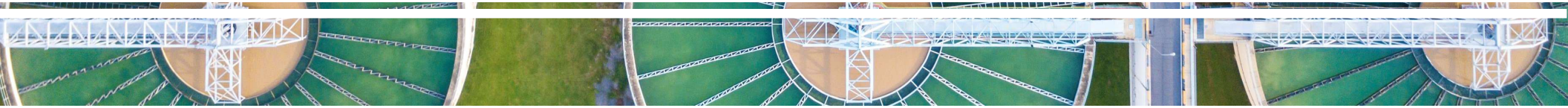
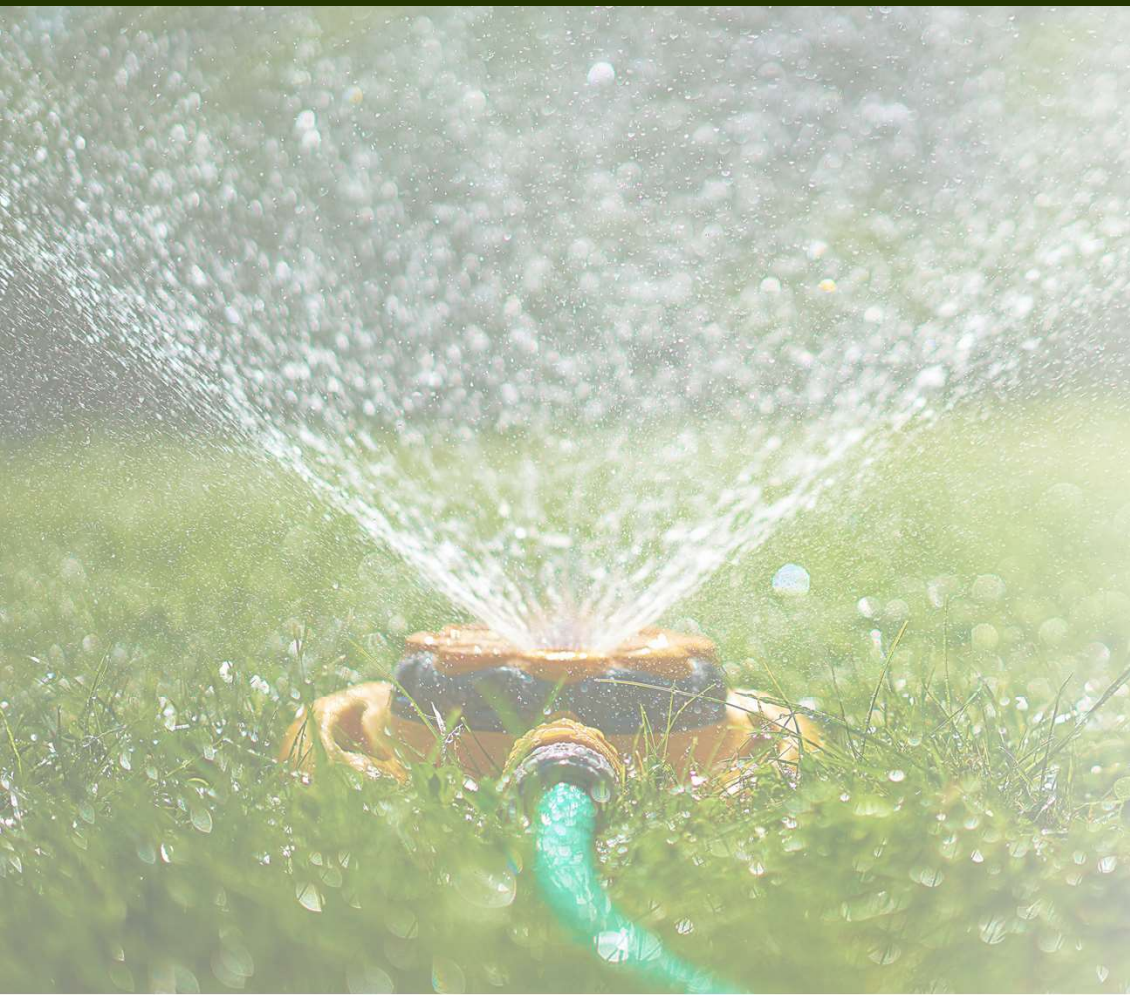


Drops to Data(D2D): A New Era in Water Supply Management



Objective: Harness the power of data to navigate the waters of change, optimizing our business operations, and contributing to a sustainable water future.



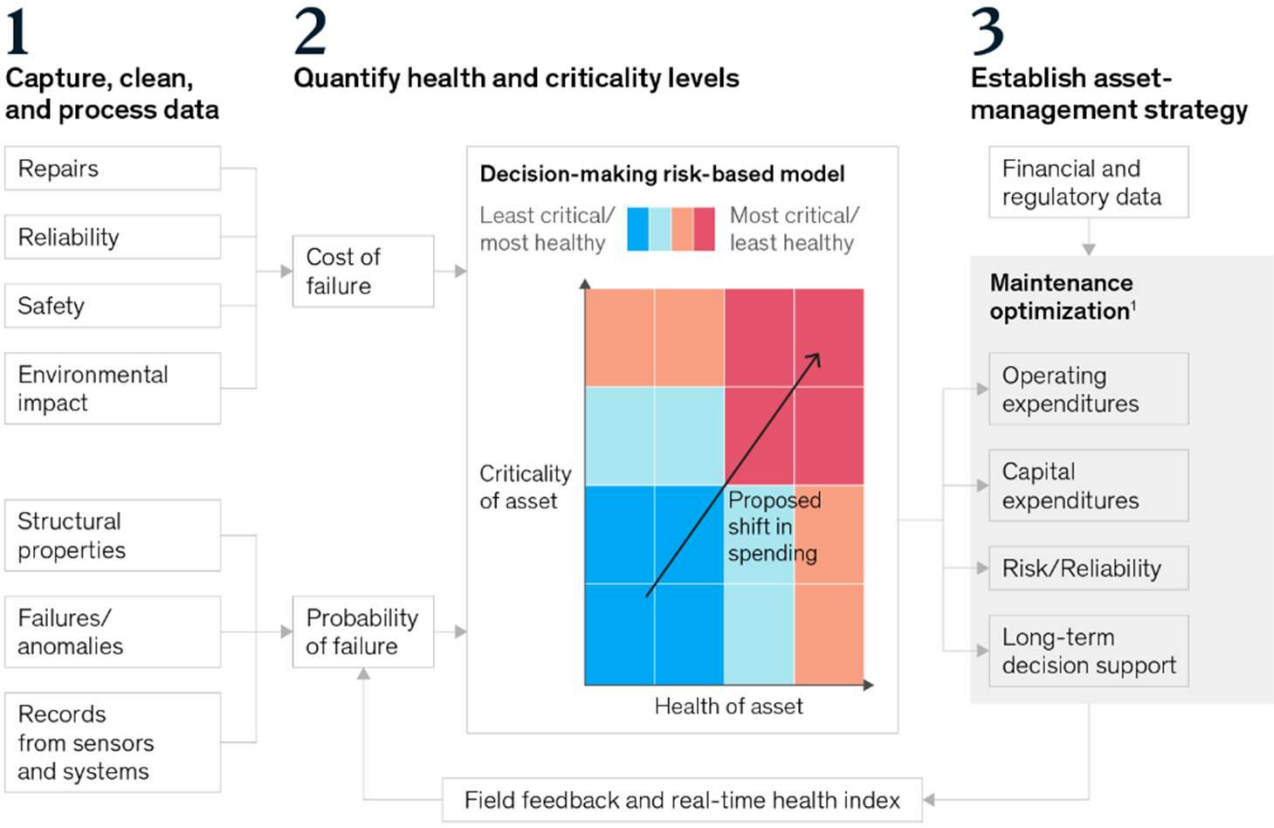
- Considering the recent UNICEF research predicting that half of the world's population could be living in areas facing water scarcity by 2025, and the potential displacement of 700 million people due to intense water scarcity by 2030, **our objective** is to build a data-based framework to **optimize our water supply business**.
- This framework will **address the pressing challenges of the water industry,** including the **severe imbalance between growing population demands and almost consistent supply, aging infrastructure, sub-optimal performance, contamination, and increasing regulatory laws.**
- **Our focus will be on the collection and analysis of data related to water quality, consumption, supply, infrastructure, and maintenance.**
- This data will enable us to **monitor and improve our services, ensuring compliance with health standards, understanding usage patterns, monitoring the efficiency of water supply, planning preventive maintenance, and improving maintenance practices.**
- Given the asset-intensive nature of the industry, with pipelines, pumps, and wells spread over vast areas, our **data-driven approach will enhance our control and management capabilities. By proactively identifying and addressing issues such as leaks, breakages, overflows, or contamination**, we aim to **prevent** severe consequences such as **expensive asset damage or critical health issues.**

Data Sources and Usage strategy

- In today's highly digitized world, defining a **sustainable strategy** for water management that uses powerful technologies — right from the Industrial Internet of Things (IIoT) to machine learning to artificial intelligence, Big Data, and predictive analytics is essential to redefine and modernize traditional water ecosystems.

- **Industrial IIoT**, in particular, in the form of **sensors, flow meters, and edge devices**, are being used to **collect on-field data** to create situational awareness and **identify leaks, sewer overflows, and faulty equipment** before these require costly repairs.

- We expect to **realize operational efficiency, decision-making rooted in analytics, and increased security as the top three benefits realized from using IIoT applications.**



[1]Advanced Analytics driven optimization.

Proposed data collection plan

1. Capture, Clean and Process data

The first actions to take would be to install necessary sensors and meters, digitize existing infrastructure and maintenance records, and set up systems for regular data collection and analysis.

We would be analysing on

a. **Water Quality Data**: Parameters like pH, turbidity, TDS (Total Dissolved Solids), and microbial content.
b. **Consumption Data**: Volume of water consumed by each household or commercial entity.
c. **Supply Data**: Volume of water supplied to each area in the city.
d. **Infrastructure Data**: Age, material, diameter of pipes, and condition of pumps and other equipment.
e. **Maintenance Data**: Records of past maintenance activities, failures, and their causes.

Data Source

a. **Water Quality Data**: Collected using water quality sensors installed at various points in the supply chain.
b. **Consumption Data**: Collected from smart water meters installed at consumer premises.
c. **Supply Data**: Collected from flow meters at water treatment plants and major distribution nodes.
d. **Infrastructure Data**: Collected from existing records and physical inspections.
e. **Maintenance Data**: Collected from maintenance logs and incident reports.

Proposed data collection plan

2. Qualify health and Criticality levels

The second actions to take would be to process and set up KPIs based on analysis of business requirements, design of dashboards, and tools for visualization and reporting. This would also, involve a data value and availability assessment and enrichment with external data for regulations.

KPIs
1.Water Quality Data: To ensure compliance with health standards and identify areas needing attention.
2.Consumption Data: To understand usage patterns and plan supply accordingly.
3.Supply Data: To monitor efficiency of water supply and identify losses.
4.Infrastructure Data: To plan preventive maintenance and infrastructure upgrades.
5.Maintenance Data: To improve maintenance practices and prevent failures.

Data Priority
1.Water Quality Data: High priority due to its direct impact on public health.
2.Infrastructure Data: High priority for preventive maintenance and reducing water loss.
3.Maintenance Data: High priority for improving service reliability.
4.Consumption Data: Medium priority for demand forecasting and tariff setting.
5.Supply Data: Medium priority for operational efficiency.

Based on current research for the project we have following assessment of in-house data (scale 1-5) :

Data Value
1.Water Quality Data: 5
2.Consumption Data: 4
3.Supply Data: 4
4.Infrastructure Data: 5
5.Maintenance Data: 5

Data Availability Assessment
1.Water Quality Data: 3
2.Consumption Data: 4
3.Supply Data: 4
4.Infrastructure Data: 2
5.Maintenance Data: 3

Resources referred

1. www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/the-power-and-gas-blog/how-to-use-analytics-to-improve-water-asset-management

2. https://acuvate.com/blog/data-driven-approaches-for-sustainable-water-management/

3. https://iwaponline.com/wpt/article/18/7/1599/95563/Digital-transformation-for-the-water-industry-how

4. Accenture case study of Water facilities company